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10 November 2016

Online at <https://mpra.ub.uni-muenchen.de/103464/>
MPRA Paper No. 103464, posted 16 Oct 2020 13:26 UTC

Multi-market Firms and Export Quota: Effects of Withdrawal of the Multi-Fiber Arrangement

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Abstract: The international trade in goods and services is dominated by multi-market firms. A firm's decision to sell in the domestic market vis-à-vis the foreign market depends on a number of factors including transport costs, price uncertainties and the barriers to trade. We study the effect of a reduction in non-tariff barriers or quotas on the optimal decision of firms to allocate output between the domestic market and the foreign market. We offer a theoretical analysis on how the firms reallocate sales between multiple markets when the exogenous barriers are lifted. We find that the theoretical conjecture might get valid support from the evolving pattern of exports by a large number of textile and apparel manufacturing firms originating in India. Principally, we obtain a condition under which the choice of the firm to operate in multiple markets depends on the relative strengths of how profit at the margin reacts to price uncertainty in one of the markets as compared to the effect of the sales in one market on the price of another. It seems that the withdrawal of the quota since 2005 has led to a greater focus on the domestic market for Indian firms and within the country there has also been an increased concentration of firms. We used the Hirschman-Herfindahl Index to measure if the Indian firms have become more concentrated in terms of sales during the previous two decades. The concentration of firms has unambiguously increased in the last two years.

JEL Classifications: F13, F14, J3, L6

Keywords: Multi-market firm, MFA, export quotas, textile, India

Acknowledgements: This paper has benefited from presentation at the Annual General Conference on Contemporary Issues in Development Economics at Jadavpur University, December 2014. The Usual disclaimer applies.

1. Introduction

A firm's decision to operate and sell its output in multiple markets is driven by many factors. For example, transport costs, which sometimes accounts for 15 to 20% of the total cost of production, significantly influences decision to operate in more than one market. Exposure to randomness in commodity prices could be an even stronger factor, in particular, when coupled with uncertainty about regulatory policies. A comparison of transaction costs in different markets can also sufficiently alter a firm's decision to diversify sales across markets. A well-known result due to Katz and Paroush (1979) however, showed that for firms operating in multiple markets, total output would not be affected even if price is uncertain in several markets, if at least one market displays price certainty. This 'separation' result holds primarily with respect to choice of output and allocation of sales across markets by a typical firm. Dalal and Katz (2003) later showed that when transport costs are introduced in this framework, the separation result continues to hold, such that the certainty of commodity prices in the domestic market determines total output regardless of the price uncertainty and other exogenous parameters in the foreign market. They also discuss conditions when the separation condition is violated. We discuss more on this in section 2, in relation to our main findings.

The present paper deals with the multi-market choice of a competitive firm that faces an export quota and uncertain price in the foreign market, whereas a certain price and a competitive product market domestically. We model the sales allocation of such a firm, first in the presence of a quota and subsequently when the quota is withdrawn. The problem is interesting in the following sense. During the regime of quota restricted export the firm enjoys a certain market for its output (foreign sales), even though the quota

might have been set at an inefficient level. We assume that even with a quota the foreign price is uncertain because there is no guarantee that quotas are fulfilled. On the other hand, the domestic price is certain and the firm sells at the level where price equals marginal cost. Subsequently, when the quota is withdrawn the firm might lose its captive market to competition from others – with a possibility that the foreign price falls. The profit maximizing reallocation of sales should then factor in the changes in the erstwhile captive market and readjust the domestic sales with significant price effects. Unless the domestic price becomes random owing to this regime shift in the international market, the firm continues to produce the same total amount as before owing to the ‘separation’ result discussed above. As a competing explanation, unless the withdrawal of quota has a significant impact on the firm, such that it exports an amount higher than the total output it produced previously, it continues to produce the amount where marginal cost equals price domestically.

Alternatively, in case the firms do not find the export market to remain viable any longer, it should divert sales to the local market with possible change in prices, *ceteris paribus*. In other words, the loss of foreign market may create excess supply of the good in the local market leading to a fall in prices. The production and employment implications of such adjustments can be substantial if the industry to which such a firm belongs is of critical importance. Indeed, the textile and apparel industry in India commands such a position by contributing about 4% of GDP, 14% of industrial production, 17% of export revenue, and by employing approximately 25 million workers directly and indirectly (Kar, 2012). Furthermore, the various effects of the withdrawal of export quota on the Indian manufacturers did not surface instantaneously. Our statistical

observations will show that the stronger effects of greater competition show up negatively on the export performance and concentration of firms only recently.

In what ways the firms and the industry as a whole respond to this regime shift in policy is an empirical question and we provide evidence from a large number of textile and apparel manufacturing firms in India between 1991 and 2013 to show that the firms have readjusted sales significantly in the aftermath of the withdrawal of the well-known quota system under the aegis of the Multi Fiber Arrangement (MFA). In this context, we also check for the level of concentration of the firms in terms of sales proceeds over this period. The problem discussed in the previous paragraph leads to a brief theoretical model that explains such an impact for the general case of sales decision by multi-market firms when exposed to trade restrictions, more akin to what is popularly known as the Voluntary Export Restraints (VER) in the related literature (see, Harris, 1985; Krishna 1988; Yano, 1989; etc).

In a related context, Kar and Kar (2014) studies issues in firm level concentration as well as employment patterns for firms producing and selling textile and apparel. It is based on firm level longitudinal data for 15 years encompassing the period over which MFA phased out gradually. Relating trade and labor market outcomes, our firm-level empirical estimates show that the export-oriented firms in India were not affected adversely and that the aggregate wage bill also rose during this period. The firm-level panel was supplemented by a state-level panel between 1998 and 2008 to capture the region-wise aggregated impact of the withdrawal of MFA on the level of labor earnings across regions in India. One of the stark results of this panel (state) fixed effects regression is that the aggregate state level wage bill falls as the profit level rises for the

industry, implying a more intensive use of capital and technology. The results also showed that regional wage disparity has strong relation with regional disparity in firm-concentration at the level of the industry as measured by the number of factories, as well as with regional disparity in sales across the states in India.

Earlier, Marjit, Kabiraj and Mukherjee (2009) have argued that entry of China in the WTO and removal of MFA shall work against the interest of many smaller countries in the South. The scale of production or sheer efficiency of Chinese manufacturers would negatively affect the erstwhile quota-protected market shares of a large number of countries and might lead to a monopoly outcome. However, as long as the monopoly price set by a large exporting country stays below the import competing price in the importing countries, gains from trade via removal of quota at destinations still improve. Using the constant market share analysis (CMS, see the original formulation in Richardson, 1971), Kar and Kar (2011) also showed that the removal of quota led to significant changes in country-wise export shares – countries with more efficient production techniques captured larger shares of the international market in the post-MFA phase. The expected global implications of the withdrawal of MFA had also been studied in Trela and Whalley (1990).

1.1 The Multi Fiber Arrangement

The Agreement on Textiles and Clothing (henceforth, ATC) ensured the dismantling of only quotas on textile and apparel items, while tariff on these items were

to stay.¹ The Multi Fiber Arrangement (MFA) provided a framework under which developed countries imposed quotas on exports of textiles and apparel from developing countries. These quotas were typically applied on a bilateral basis and were product-specific as defined by fiber and function. This allowed discrimination not only against specific fibers and products but also among exporting countries. The exporting countries' governments administered the MFA export-quotas, which were allocated to them based on predetermined criteria. This iniquitous system of quotas thus violated all the fundamental principles of the multilateral trading system, and discriminated against the poorest countries and those seeking to move up from reliance on primary commodities to manufacturing.

In other words, despite removal of MFA international trade in clothing and textile would still not be entirely free, but only 'quota-free'. In addition, in the presence of political equations in an ever more complicated world of multilateral negotiations the extent of compliance with ATC on the part of importing countries remains unclear. This impending reality brings the issue of competitiveness to the fore for all the exporting countries, including India. In fact, the end of the MFA and the removal of global textile quotas on January 1, 2005 have radically changed the global scenario of apparel production and trade (Appelbaum, *et al.* 2005; Gereffi, 2004; UNCTAD, 2005; USITC, 2004; WTO, 2004, etc.). There was widespread expectation that without the restrictions of the quota, large, low-wage countries with well-developed export capacities such as China and India would be the prime beneficiaries at the cost of smaller exporting countries. Developing countries from across the world with some share of textile and

¹ The Uruguay Round of GATT launched at Punta Del Este led to the Agreement on Textiles and Clothing (ATC) in 1995. It is the institutional shape given to the promise to end quotas in an orderly process within ten years divided into three consecutive phases.

apparel exports, such as Lesotho in Africa, Bangladesh in Asia and El Salvador in Central-South America that had previously benefited from the protection of the quota shall lose out. The loss of market would also be associated with high-wage countries like the USA, Western Europe and the East Asian “Big Three” (Knappe, 2003; USITC 2004; UNCTAD 2005; WTO 2004, etc.). Statistical support is available for the loss of thousands of textile and apparel jobs in the USA and Latin America (Bair and Dussel, 2006), the growing consolidation among large global buyers (Gereffi, 2005), the withdrawal of FDI from the garment industries in some small countries, such as Mauritius, Lesotho and Madagascar (Gibbon, 2008), and significant price deflation experienced by many apparel exporters worldwide.

In such a volatile and uncertain environment as countries search for ways to compete, the issue of costs, in particular, wage costs have emerged as a central consideration in the debate over export competitiveness in the apparel industry. For example, in India where labor laws were regarded as relatively ‘inflexible’ and therefore would render coping with low wage competition difficult, the industry lobby has undoubtedly put up a case for dismantling several labor protections. This, according to the argument should allow localize small producers to scale-up and subsequently compete with countries like Bangladesh, China, and Mexico (Hashim, 2005; Gherzi Report, 2003). However, Tewari (2006) questions the view as to whether the cost-competitiveness, particularly via low wage costs and large scales of operation, is enough to achieve sustained export competitiveness in the textile and apparel industry after the removal of quotas. It reviews the evidence emerging from a growing body of literature on the institutional organization of global trade networks and production chains to argue that

in an environment characterized by uncertainty and regulatory flux, and where buyers demand many more attributes in addition to price – such as product variety, quality, customization and timely delivery – global competitiveness in the apparel industry presently requires competency that go well beyond traditional factors of relative price and low wages. Indeed, under volatile market conditions and shortened product cycles, large scales of operation can add to costs unless they are embedded within other capabilities that lower the risk and cost of large volumes (i.e., of rigidity). These capabilities include skills, management practices, productive relationships and some promotional activities that allow firms to combine speed and scale with more skilled functions such as designing, maintaining consistency in quality, keeping low inventories, ensuring timely supply, and establishing direct ties with most efficient distribution networks. This should arguably offer greater dynamic comparative advantages replacing exclusive dependence on low wages. The development of these capabilities varies not only across nations, but also among firms and regions within nations.

Based on these observations, we offer a brief analytical section on how a multi-market firm allocates sales. We offer some statistical observations on the industry level performance in section 3 and conclude in section 4.

2. The Model

Consider a firm in a competitive market that produces a single product and sells in two markets – domestic (D) and foreign (F). The foreign market in connection with the prevalence of MFA as discussed above exercise a quota on how much a country can sell as a whole. The firm under consideration is one among a large mass (n) of homogeneous

and identical firms in the country and shares the total output as well as the foreign quota equally with others. This is denoted by $\bar{q}_f^i, i = 1 \dots n$. If the firm's total output is q^i , then the domestic sale is given by, $q_d^i = q^i - \bar{q}_f^i$, of which \bar{q}_f^i is the amount of the export quota facing the firm.² We assume that the foreign price (\tilde{p}_f) is a random variable, and therefore uncertain, while the domestic price (p_d) is certain. Since \tilde{p}_f is a random variable, it should be noted that for a risk averse firm the higher is the randomness in prices the lower is the dependence on such markets where prices are volatile. The cost function is convex, such that, $C(q) = q^\alpha$, where $\alpha > 1$ and $C_q > 0, C_{qq} > 0$. There is also a fixed cost of setting up the firm, $k > 0$. We do not focus on the distributional aspects of the randomness in foreign price (see Dalal and Katz, 2004 for additive or multiplicative distributions). Further, the risk-averse firm maximizes the expected utility of profit under two states of nature. First, we will find out the allocation of sales between home and foreign markets and second, we will observe how this allocation changes when the international market for textile and apparel undergoes a regime shift in policy. In fact, we will offer the condition under which the export (as against domestic sale) by the firm under consideration may rise or fall. Finally, we will assume that the firm representing a developing country enjoys a comparative advantage and exports to a rich country, such that, even with changes in international policies there would be no reversals in the direction of trade. It should be pointed out that in related problems with a firm deciding on a distribution of sales between domestic and foreign markets, it has previously been

² If the firms are not identical and vary in terms of size, while being part of a competitive market, the export share can be proportional to the size, and the domestic demand facing the firm should also have different intercepts. Presently, it should not alter our results. In future extensions we wish to consider a distribution of firms on a scale of size and/or risk aversion to cultivate potential differences in the choice problem.

shown that depending on the nature of the transport cost function (non-linear) present in the domestic market, the separation result alluded to in the beginning fails to hold. In particular, introduction of domestic transport cost essentially lowers output, since it shifts the marginal cost curve to the left. It is independent of whether the transport cost exists in the export market or not (Dalal and Katz, 2003). The non-linearity of the transport cost in the domestic market will render the determination of marginal transport cost in the domestic market a function of the sales in that market and consequently, the ‘total output’ shall also depend on foreign parameters. But, the introduction of positive transport costs in both markets may still lead to positive sales in both places if the marginal expected profits in the foreign market exceed marginal profits in the domestic market. In our case, withdrawal of quota does not disrupt the separation condition, but makes the foreign profit at the margin a function of the domestic price and its response to foreign sales.

Thus, when the regime of quota under the MFA is in place the firm maximizes the expected utility of profit with respect to the choice of domestic and foreign sale, of which the upper limit of the foreign sale is exogenously fixed. Since selling below the quota is inefficient, we will assume that the quota is utilized in full. In fact, Bark and de Melo (1989) point out that if approximately 80% of a quota is fulfilled, it is considered to be in full use. The expected utility function of the i th firm is given by:

$$\max_{q_d, \bar{q}_f} E[U(\pi)] = E[U(p_d q_d + \tilde{p}_f \bar{q}_f - q^\alpha - k)] \quad (1)$$

Here, we must re-emphasize the result due to Katz and Paroush (1979), which shows that for a firm operating in a multi-market environment the total quantity produced is determined directly by the equality of marginal cost and price, if the price in at least one market is certain regardless of uncertainties prevailing in other markets. Using this

separation theorem, we obtain the first order condition as:

$$\frac{\delta}{\delta q_d} E[U(\pi)] = \frac{\delta\{E[U(p_d q_d + \tilde{p}_f \bar{q}_f - q^\alpha - k)]\}}{\delta q_d} = p_d - \alpha q^{\alpha-1} = 0 \quad (2)$$

where, $q = q_d + \bar{q}_f$.

Second, since it is inefficient to sell less than the quota,

$$\frac{\delta\{E[U(p_d q_d + \tilde{p}_f \bar{q}_f - q^\alpha - k)]\}}{\delta \bar{q}_f} = -\alpha q^{\alpha-1} = 0 \quad (3)$$

The second-order conditions (from 2 and 3) offer a negative value for profit maximization.

$$\text{Thus, from (2)} \quad q^{i*} = \left(\frac{p_d}{\alpha} \right)^{\frac{1}{\alpha-1}} = q^* \quad (4)$$

The domestic sale of this firm (and all the other identical firms) is given by,

$q_d^* = q^* - \bar{q}_f$. In other words, this offers a combination of (q_d^*, \bar{q}_f) as allocation of sales

in the two markets. This presumes that in the quota-administered regime, the firms utilized the full amount of the quota, because not selling the whole amount allocated by exogenous reasons would be inefficient.

2.1 *Withdrawal of Quota*

Next, suppose that the quota system under the Multi-Fiber Arrangement is withdrawn following a policy change in the WTO. The withdrawal of the quota is expected to lower the international price and redirect sales to the domestic market where the price may fall due to excess supply. Given that the policy change shall have price implications for both the destination and the source countries, it evidently calls for

looking at the total change. However, we retain the assumption that even if the domestic price falls, the price is still certain and therefore the total output is determined according to the previous condition where the firm equates domestic price to the marginal cost in order to determine the level of total output. The more pertinent question is however, as to how much the firm now allocates between D and F , which is to be decided subject to changes in the foreign market price on which one country (and less still, one firm) has little or no influence. In other words, $q_f(\tilde{p}_f)$ is the amount that the firm decides to allocate to foreign sales following the optimization exercise. Here, we must look at the total change in the following way. Equation (1) is re-written as,

$$\max_{q_f(\tilde{p}_f)} E[U(\pi)] = E[U(p_d q_d + \tilde{p}_f q_f(\tilde{p}_f) - q^\alpha - k)] \quad (5)$$

Differentiating totally,

$$E[U'(\pi)\{q_d dp_d + p_d dq_d + q_f(\tilde{p}_f) d\tilde{p}_f + \tilde{p}_f dq_f(\tilde{p}_f) - \alpha q^{\alpha-1} dq - dk\}] = 0$$

Note that, $dk=0$.

Therefore,

$$E[U'(\pi)\{q_d dp_d + p_d dq_d + q_f(\tilde{p}_f) d\tilde{p}_f + \tilde{p}_f dq_f(\tilde{p}_f) - \alpha q^{\alpha-1} dq\}] = 0$$

such that,

$$\frac{dE[U(\pi)]}{dq_f(\tilde{p}_f)} = E[U'(\pi)\{q_d \frac{dp_d}{dq_f(\tilde{p}_f)} + p_d \frac{dq_d}{dq_f(\tilde{p}_f)} + q_f(\tilde{p}_f) \frac{d\tilde{p}_f}{dq_f(\tilde{p}_f)} + \tilde{p}_f - \alpha q^{\alpha-1} \frac{dq}{dq_f(\tilde{p}_f)}\}] = 0$$

where, $\frac{dq}{dq_f(\tilde{p}_f)} = [\frac{dq_d}{dq_f(\tilde{p}_f)} + 1]$.

So, $E[U'(\pi)\{q_d \frac{dp_d}{dq_f(\tilde{p}_f)} + p_d \frac{dq_d}{dq_f(\tilde{p}_f)} + q_f(\tilde{p}_f) \frac{d\tilde{p}_f}{dq_f(\tilde{p}_f)} + \tilde{p}_f - \alpha q^{\alpha-1} (\frac{dq_d}{dq_f(\tilde{p}_f)} + 1)\}] = 0$

$$\text{or, } E[U'(\pi)\{q_d \frac{dp_d}{dq_f(\tilde{p}_f)} + (p_d - \alpha q^{\alpha-1}) \frac{dq_d}{dq_f(\tilde{p}_f)} + \frac{q_f(\tilde{p}_f)}{dq_f(\tilde{p}_f)} \frac{d\tilde{p}_f}{d\tilde{p}_f} + \tilde{p}_f - \alpha q^{\alpha-1}\}] = 0$$

Rearranging,

$$E[U'(\pi)\{q_d \frac{dp_d}{dq_f(\tilde{p}_f)} + (p_d - \alpha q^{\alpha-1}) \frac{dq_d}{dq_f(\tilde{p}_f)} + \frac{\tilde{p}_f}{dq_f(\tilde{p}_f)} \frac{d\tilde{p}_f}{d\tilde{p}_f} + \tilde{p}_f - \alpha q^{\alpha-1}\}] = 0$$

Define, $\eta_{qf} = -\frac{dq_f(\tilde{p}_f)}{d\tilde{p}_f} \frac{\tilde{p}_f}{q_f(\tilde{p}_f)}$ as the elasticity of demand facing the firm in the

foreign market.

$$\text{Thus, } E[U'(\pi)\{q_d \frac{dp_d}{dq_f(\tilde{p}_f)} + (p_d - \alpha q^{\alpha-1}) \frac{dq_d}{dq_f(\tilde{p}_f)} + (\tilde{p}_f(1 - \frac{1}{\eta_{qf}}) - \alpha q^{\alpha-1})\}] = 0 \quad (6)$$

Further, let $E(\tilde{p}_f) = \bar{p}_f$.

Since, $Cov(X, Y) = E(XY) - E(X)E(Y)$ we can re-write (6), which is of the $E(XY)$

form, in the following way.

$$Cov[U'(\pi), \tilde{p}_f] + E[U'(\pi)]E[q_d \frac{dp_d}{dq_f(\tilde{p}_f)} + (p_d - \alpha q^{\alpha-1}) \frac{dq_d}{dq_f(\tilde{p}_f)} + (\tilde{p}_f(1 - \frac{1}{\eta_{qf}}) - \alpha q^{\alpha-1})] = 0 \quad (7)$$

The first term on the LHS of (7) is negative, because the marginal utility of profit of a risk-averse firm shall go down if the randomness in price rises. In other words,

$$Cov[U'(\pi), \tilde{p}_f] < 0.$$

Re-organizing (7)

$$Cov[U'(\pi), \tilde{p}_f] + [q_d \frac{dp_d}{dq_f(\tilde{p}_f)} + (p_d - \alpha q^{\alpha-1}) \frac{dq_d}{dq_f(\tilde{p}_f)} + (\bar{p}_f(1 - \frac{1}{\eta_{qf}}) - \alpha q^{\alpha-1})]E[U'(\pi)] = 0$$

$$\text{or, } \bar{p}_f(1 - \frac{1}{\eta_{qf}}) - \alpha q^{\alpha-1} = -\frac{Cov[U'(\pi), \tilde{p}_f]}{E[U'(\pi)]} - q_d \frac{dp_d}{dq_f(\tilde{p}_f)} - (p_d - \alpha q^{\alpha-1}) \frac{dq_d}{dq_f(\tilde{p}_f)} \quad (8)$$

Since, the firm continues to equate domestic price to marginal cost of production in the domestic market, therefore, $(p_d - \alpha q^{\alpha-1}) = 0$. So, equation (8) transforms to

$$\bar{p}_f \left(1 - \frac{1}{\eta_{qf}}\right) - \alpha q^{\alpha-1} = - \frac{\text{Cov}[U'(\pi), \tilde{p}_f]}{E[U'(\pi)]} - q_d \frac{dp_d}{dq_f(\tilde{p}_f)} \quad (9)$$

The term on the left hand side is the expected marginal profit from selling in the foreign market. The right hand side includes a positive term, $\frac{dp_d}{dq_f(\tilde{p}_f)} > 0$, and a negative term,

$\text{Cov}[U'(\pi), \tilde{p}_f] < 0$. The necessary condition for positive marginal profit in the foreign

market is: $-\frac{\text{Cov}[U'(\pi), \tilde{p}_f]}{E[U'(\pi)]} > q_d \frac{dp_d}{dq_f(\tilde{p}_f)}$ and the sufficient condition is that

$\frac{dp_d}{dq_f(\tilde{p}_f)} = 0$. If the foreign quantity choice by the firm does in no way affect the

domestic price, it will continue to sell positive amounts in both markets. It should further mean that the export price must ideally exceed the domestic price for positive participation in both markets.³

However, if the price volatility goes down significantly in the foreign market, the marginal utility from profit rises there and the weight assigned by the risk-averse firm to the export market rises. It may lead to a positive economic profit at the margin and that the firm may continue to sell in both markets (with sales under competitive conditions in the domestic market). However, this is hardly ensured. Therefore, when we reformulate the above condition (equation 9, using 2), a positive difference may not exist between the foreign price (weighted by the elasticity of demand in the foreign market) and the

³ Dalal and Katz (2003) show that a positive profit and positive sale in the export market are feasible even if the export price is lower than the domestic price (essentially if the marginal transport cost at home exceeds that for the foreign country).

domestic price, i.e.,

$$\bar{p}_f \left(1 - \frac{1}{\eta_{qf}}\right) - p_d = - \frac{\text{Cov}[U'(\pi), \tilde{p}_f]}{E[U'(\pi)]} - q_d \frac{dp_d}{dq_f(\tilde{p}_f)} \quad (10)$$

From (10), it is clearly not possible that the firm will sell a positive amount if the export price weighted by the demand elasticity is lower than the domestic price. For a given amount of output larger sale in the foreign market must raise the domestic price and *vice versa*. In case of the withdrawal of the quota under MFA it is possible that the foreign sale goes down for a firm leading to excess supply in the domestic market and a fall in price. This should allow the price difference to rise and beyond a critical level, where the firm is indifferent between domestic and foreign sales, it may fall. The converse may also hold, wherein the difference between the two prices is negative (a case where withdrawal of quota allows a large number of firms from an equally large number of countries) to supply in the previously regulated market, crashing the foreign price and raising the domestic price as a consequence. It might then lead to a ‘U-shaped’ relation as the entry and exit of firms (and countries) respond heavily to price movements.

Equation (9) therefore, suggests a possibility. Whether the firm continues to sell in both markets depends on whether the expected marginal profit from foreign sales exceeds that from the domestic sales. If $[\bar{p}_f (1 - \frac{1}{\eta_{qf}}) - \alpha q^{\alpha-1}] > 0$, then the firm continues to participate in both markets, since the condition for sale in the domestic market is based on the equality of marginal cost and price. The marginal expected profit in the foreign market exceeds that in the domestic market allowing the firm to sell in both. But, more generally, $[\bar{p}_f (1 - \frac{1}{\eta_{qf}}) - p_d] \begin{matrix} > \\ < \end{matrix} 0$ does not ensure the distinct possibility

of multi-market activity by the firm, because the domestic price responds to how much the firm sells in the foreign market based on the expected foreign price. This result would not hold in the event of a quota, where regardless of the price impact, the firm cannot sell more (and for efficiency reason, less) to the export market.

The withdrawal of MFA as an example is particularly revealing in this case. Since the effect of free entry and exit of countries (and firms) might make the international price more volatile or less, it should determine if the first terms on the right hand side of (9) dominates or the second term. In either case, this at least opens up the possibility of non-monotonic patterns in the export performance by such firms. The firm may either continue to export more if price becomes less volatile, or focus more on the domestic market if the price becomes more volatile. It might give rise to U-shaped or inverted U-shaped export performance by the firm as measured over time.

3. Evidence from Indian Textile and Apparel Manufacturers

The statistical observation follows from data selected over 15 years between 1991 and 2013. The number of firms producing textile and apparel goes up to thirteen hundred, of which the number of purely exporting firms is actually negligible. Figure 1 shows that except for the year 2004, the number of firms that only cater to the export market has not gone up above 30. In terms of annual trend, the number of purely exporting firms was fairly small in the early years, reaching up to 30 in 1998, 32 in 2004 and falling steadily since then. In fact, after reaching a peak in 2004, the year when the final phase of the process of dismantling of MFA began globally, the number of firms involved in the business of exports only hovered around 20 till 2011. In recent years, the number has

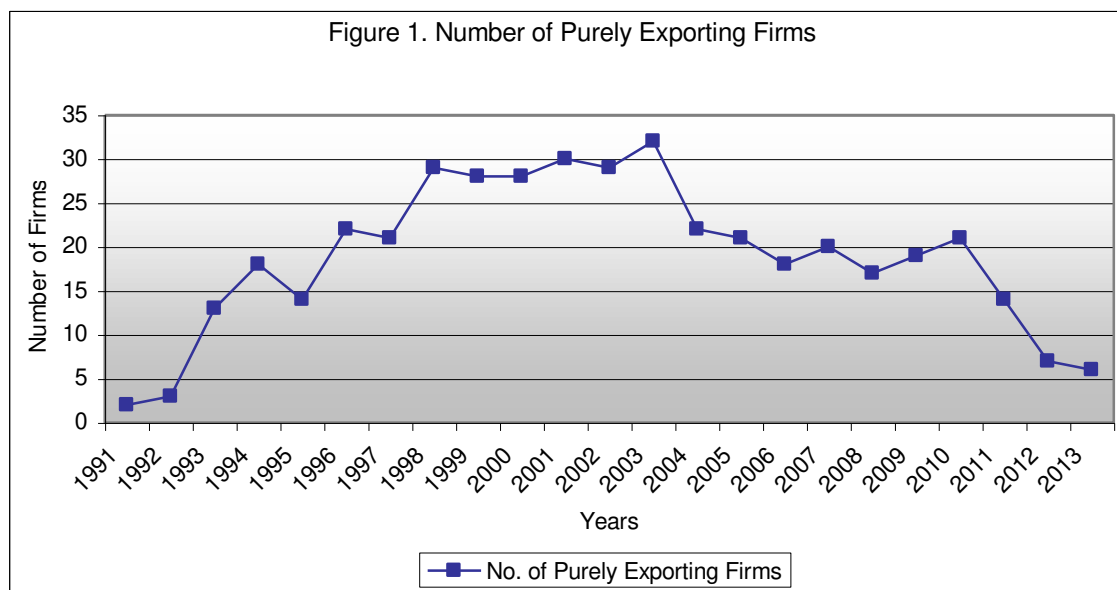
gone down to just 5. Table 1 offers a descriptive statistics regarding the extent of total sales value, the domestic sales component and the revenue from export sales as well as the average percentage of export-to-total sales for approximately 415 firms that operate in both markets. The data accumulated over 13 years offer a large amount of data points, although admittedly, the group of firms is not the same for every year. The export-sale percentage is an average of all firms for a particular year and it shows that the mean of annual averages is approximately 34%.

The export revenue of the multi-market firms also shows an inverted U-shape analogous to the number of firms exclusively engaged with export. It seems that the analytical conjecture presented above holds in favor of more emphasis on the domestic market for the multi-market firm at the margin. The export as percentage of total sales went up from 20% in the early 1990s to 40% in 2003-04, right before the final phase of the abolition policy took shape. After 2004-05, the export proceeds as percentage of total sales goes down close to 30% and with a slight improvement in 2010-11 the share stays at 30% currently.

This is expected to impart certain readjustments at the domestic level, where we measured the concentration of firms according to the total sales reported every year. Since the firms vary in terms of size and sales capacity, it is quite possible that all firms will not be able to cope with the imminent pressure of international price meltdown subsequent to the withdrawal of export quota. This might lead to firms either losing business entirely or agglomerating with relatively larger ones in order to stay in business. With the help of the Hirschman-Herfindahl Index (HHI), we showed that over most years the effects were not remarkable.

Table 1. Descriptive Statistics (Values in million Rs)							
	Mean	Std.Dev.	Skewness	Kurtosis	Minimum	Maximum	NumCases
SALES-VALUE	2620.65	7546.81	12.0645	237.12	0.02	203105	5369
EXPRT-VALUE	733.203	1945.21	9.4432	160.783	0.1	46677.4	5456
DOM-SALE	1868.37	6249.4	12.0741	217.62	0.3	156427	5456
EXPORT-SALE	33.91	32.3903	0.726772	2.15836	0.05	126.876	5455

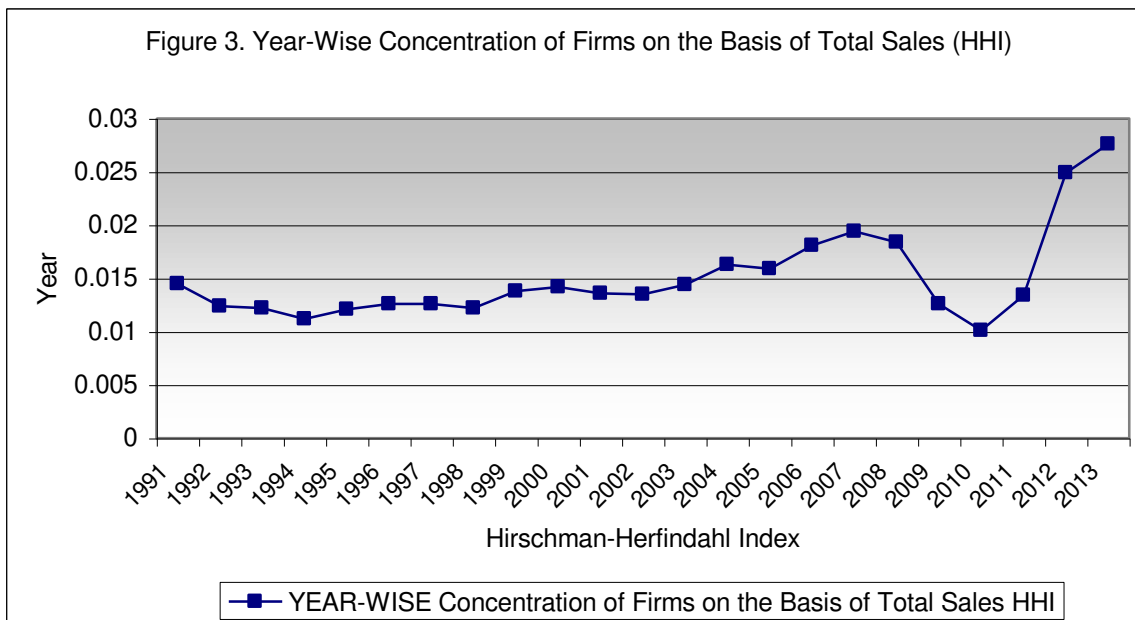
Data Source: Centre for Monitoring Indian Economy – Prowess Database



Data Source: Centre for Monitoring Indian Economy – Prowess Database



Data Source: Centre for Monitoring Indian Economy – Prowess Database



Data Source: Centre for Monitoring Indian Economy – Prowess Database

Figure 3 shows that the year-wise concentration of firms as per total sales went down since 1991 and stayed close to 1% for the entire decade of the 1990s. The concentration index doubled around 2007-08, but fell subsequently to the lowest level since the beginning of the data used for this analysis. However, from 2010 onwards, the rise has been remarkable and the level of concentration of firms has been close to three times the level in 2010. The price effects in the international market and its implications for the domestic market can be varied, and slow at the same time. The higher degree of concentration at the level of textile and apparel industry is probably suggestive of the fact that the smaller firms are finding it difficult to coexist with the bigger ones after the quota has been completely removed. One pertinent question is how did the smaller firms compete with the bigger ones even during the regime of quota protection? It is possible that the export quota allowed many firms to focus on the external markets while leaving the internal market to the disposal of small and medium-sized firms. However, in the event of removal of the quota, and the entry of China in the WTO has pushed many such firms to stiff competition from low-cost production from the Chinese industries. This might have influenced the erstwhile exporters and those with substantial interest in the foreign market alongside the domestic market, to depend more on the local sales. The consequent effect on price domestically have made small and medium-sized firms non-competitive. Hence, over time the market share lies with a fewer firms compared to that in the previous decades. Note that, albeit we did not offer a rigorous empirical exercise to explain the exact degree by which the substitutability between foreign market and domestic market takes place, and identify the factors that significantly cause such reallocation, the descriptive analysis still suggest that the reallocation by firms operating

in multiple markets can be conditional. In some cases, it is equally feasible that the emphasis on the foreign market goes up despite a price or quantity shock facing the country or the firms.

The effect of MFA phase-out on countries that gained and lost can be largely explained by the competitiveness effect. Much in contradiction to the earlier belief that removal of quota shall lead to market expansion for all exporters, several exporting countries and firms therein have witnessed negative impact in the recent times. This holds true for the quinquennial and the annual results for most of the countries including India. On the other hand, that countries like Thailand, Malaysia and Indonesia would suffer more in the face of competition from China and India turns out to be additional outcomes (see, Kar and Kar, 2011) of the drive towards freeing world trade from non-competitive barriers.

4. Concluding Remarks

This paper showed that when faced with uncertainty in certain markets vis-à-vis certainty of price in at least one of the markets facing a multi-market firm, the output and allocation decisions depend crucially on the standard comparison of marginal cost and price in the certain market. We used the separation result discussed in the beginning as an important instrument for this paper, in order to understand the implications of a quantity shock in the uncertain market on the price and sales reallocation in both certain and uncertain markets. To this end, we utilized the withdrawal of quota as a policy shock for the large textile and apparel industry worldwide with huge significance for a host of developing countries. The analytical section suggested that if the change in marginal

utility from profit (of a representative firm) owing to the change in the randomness of the foreign price outweighs the potential fall in price in case the firm focuses more on the domestic market, then the firm should continue to export a positive amount. The export share may even exceed the pre-withdrawal level. Conversely, if the withdrawal of quota and larger focus on the domestic market leads to a negative effect on the profit from foreign sales at the margin, then the firm is most likely to withdraw entirely from the foreign market and sale the full amount in the domestic market. Anywhere in between, the level of participation may go up or go down over time leading to possible U-shaped curves. We used some statistical observations from the firm level sales data for a large number of Indian firms dealing with textile and apparel. We did find that both the number of pure exporting firms as well as export as a share of the total sales display inverted U-shaped relation between 1991 and 2013. In fact, even though the slow phasing-out of MFA began way back in 1995, the number of pure exporting firms went up in the next ten years only to plummet to a very low level near the end of the series. It means that, while there has been widespread recognition of the fact that India did not fulfill the quota allotted to it even during the regime of protection, the quota still offered substantial protection to firms for exploring the foreign market. The withdrawal of the quota has in turn reduced both participation and sale in such markets. In addition, it may have rendered small and medium-sized firms unviable in the local market leading to greater market concentration for this industry.

A host of other issues, including the impact of textile industry on general growth and welfare levels should in future help to understand the broader reach of the trade policy dealt with in this chapter. Similarly, it would be interesting to investigate the

implications of MFA withdrawal on the labor market in further detail and discuss relevant policy aspects.

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